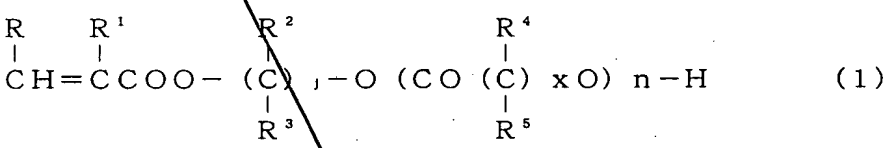
ABSTRACT

The present invention Nos. I and II relate to a hydroxyalkyl(meth)acrylate composition (a) modified by a small amount of lactones in which a proportion of monomers having two or more continuous chains ($n \geqq 2$) of lactone is less than 50% (area % by GPC) which is obtained by a ring-opening polymerization of a lactone with a hydroxyalkyl(meth)acrylate, a method for the preparation thereof, and an acrylic polyol resin using thereof,



(1)

(in the formula, R, R^1, R^2, and R^3 are independently a hydrogen or a methyl group, "j" is an integer of 2-6, xn pieces of R^4 and R^5 are independently a hydrogen atom or an alkyl group having a carbon number of 1-12, "x" is 4-7, "n" is 0 or an integer of not less than 1, and an average value of "n" in the composition is not less than 0.3 to less than 1.0).

By allowing to react the composition with other ethylenic unsaturated monomer and to formulate with a commonly-used crosslinking agent and other commonly-used components, there can be obtained a well-balanced high quality finishing agent for industries, an ultraviolet ray- or electron beam-curable coating agent, a composition which can be modified for a reactive improver, etc., and an acrylic polyol resin using thereof.

The present invention No. III relates to a curable resin

composition containing 0.5-80 parts by weight of an acrylic polyol resin (A) obtained using a hydroxyalkyl(meth)acrylate composition (a) modified by a small amount of lactones and 0.5-50 parts by weight of a melamine resin (B) [total of the (A) and (B) does not exceed 100 parts by weight] as essential components.

By the composition, even in a melamine-based curing system which is low in price, there can be obtained a curable-type coating composition in which an acid resistance is improved and highly well-balanced between an acid resistance and abrasion resistance, and which is also excellent in flexural resistance and adhesion in recoating.

The present invention No. IV relates to a curable resin composition containing 0.5-80 parts by weight of an acrylic polyol resin (A) containing a hydroxyalkyl(meth)acrylate composition (a) modified by a small amount of lactones as a polymerizing component and 0.5-50 parts by weight of a melamine resin (B) [total of the (A) and (B) does not exceed 100 parts by weight] as essential components.

By the composition, even in a melamine-based curing system which is low in price, there can be obtained a curable-type coating composition in which an acid resistance is improved and highly well-balanced between an acid resistance and abrasion resistance.

The present invention No. V relates to a curable resin composition containing 0.5-80 parts by weight of an acrylic polyol resin (A) obtained using a hydroxyalkyl(meth)acrylate composition (a) modified by a small amount of lactones and 0.5-50 parts by weight of a polyisocyanate compound (B) [total of the (A) and (B) does not exceed 100 parts by weight] as essential components.

By the composition, even in an isocyanate-based curing system, there can be obtained a curable-type coating composition in which a pot life is long and workability is improved, and which is highly well-balanced between an acid resistance and abrasion resistance, and which can provide a coating layer which is excellent also in flexural resistance and adhesion in recoating.

The present invention No. VI relates to a curable resin composition containing 0.5-80 parts by weight of an acrylic polyol resin (A) obtained using a hydroxyalkyl (meth) acrylate composition (a) modified by a small amount of lactones and 0.5-50 parts by weight of a polyisocyanate compound (B) [total of the (A) and (B) does not exceed 100 parts by weight] as essential components.

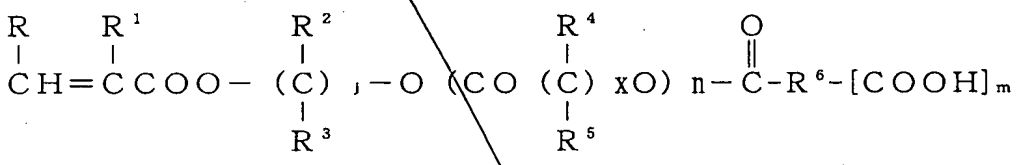
By the composition, even in an isocyanate-based curing system, there can be obtained a curable-type coating composition in which a pot life is long and workability is improved, and which is highly well-balanced between an acid resistance and abrasion resistance, and which can provide a coating layer which is excellent also in flexural resistance and adhesion in recoating.

The present invention No. VII relates to a thermosetting resin composition containing 2-50 parts of an acrylic polyol resin obtained using a hydroxyalkyl (meth) acrylate composition (a) modified by a small amount of lactones and 30-80 parts of an acrylic copolymer having an alkoxysilyl group.

By the composition, there can be obtained a thermosetting resin

composition in which crosslinking density is elevated and hardness and abrasion resistance are improved as well as solving a problem of acid resistance and odor.

The present invention No. VIII relates to a carboxylic group-contained acrylate composition (a') modified by a small amount of lactones represented by a formula described below by allowing to react a hydroxyalkyl (meth) acrylate composition (a) modified by a small amount of lactones with a carboxylic anhydride,



(in the formula, R, R^1, R^2, and R^3 are independently a hydrogen or a methyl group, "j" is an integer of 2-6, xn pieces of R^4 and R^5 are independently a hydrogen atom or an alkyl group having a carbon number of 1-12, "x" is 4-7, "n" is 0 or an integer of not less than 1, an average value of "n" in the composition is not less than 0.3 to less than 1.0, R^6 is a residual group of a carboxylic acid, and "m" is an integer of 1-3), and relates to a method for the preparation thereof.

By the method, there can be readily, efficiently, and economically obtained the carboxylic group-contained acrylate monomer composition modified by a small amount of lactones.

The present invention No. IX relates to a curable resin composition containing 10-70 parts of an acrylic polycarboxylic resin essentially containing the carboxylic group-contained hydroxy (meth) acrylate

monomer composition (a') modified by a small amount of lactones as a polymerizing component and 0.5-80 parts of a polyepoxide.

By the composition, there can be obtained a curable-type resin composition which can form a coating layer which is excellent in acid resistance, abrasion resistance, yellowing resistance, and outer appearance, and which is curable at a low temperature.

The present invention No. X relates to a polyester unsaturated monomer (a'') modified by a small amount of lactones in which less than 1 mol of ε-caprolactone is allowed to react with 1 mol of a radically polymerizable unsaturated monomers containing carboxylic group under the presence of an acidic catalyst, and relates to a method for the preparation thereof. By the method, there can be readily and industrially prepared the monomer in a short step.